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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/619,669

07/19/2000

Yasuyuki Morishita

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01/30/2002

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EXAMINER

NGUYEN, DILINH P

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 01/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/619,669

Applicant(s)

MORISHITA, YASUYUKI

Examiner

DiLinh Nguyen

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (figs. 5A-5B) in view of Chang et al. (U.S. Pat. 6274909).

Applicant Admitted Prior Art (figs. 5A-5B) disclose:

an input/output protection device for a semiconductor integrated circuit having a substrate of a first conduction type, an internal circuit, an input/ output terminal.

Electrode wiring, and signal wiring, the protection device comprising:

a first diffusion layer 104 fabricated in a region of the first conduction type of the semiconductor substrate 101, the layer having a second conduction type opposite the first conduction type and being connected to the input/output terminal 107; and

a second diffusion layer of the second conduction type being held at a predetermined potential. Applicant Admitted Prior Art fail to disclose a third diffusion layer of the second conductive type fabricated at a bottom of the second diffusion layer, the third diffusion layer being connected to the second diffusion layer, the first diffusion layer being circularly enclosed with the second and third diffusion layers.

Chang et al. disclose a semiconductor device (figs. 5a-5b, column 5, lines 62 et seq.) comprising:

a diffusion layer 34 of the second conductive type (N) fabricated at a bottom of a diffusion layer 32, the diffusion layer 34 being connected to the diffusion layer 32; and

a diffusion layer 31 being circularly enclosed with the diffusion layers 32 and 34.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Applicant Admitted Prior Art (figs. 5A-5B) to provide a ESD devices with a guard rings structure to block high energy current from the internal circuits, as show by Chang et al.

- Regarding claims 2-3, 21-23 and 26, Applicant Admitted Prior Art (figs. 5A-5B) disclose the first conduction type of the semiconductor substrate includes a diffusion layer 102 and it would have been obvious that the layer 102 having an impurity concentration higher than the substrate and monotonously decreases in a direction from a surface of the substrate to an inner section thereof.
- Regarding claims 4 and 13, it is conventional in the art to find the optimal thickness of the diffusion layer through routine and obvious experimentation. It would have been obvious to one having ordinary skill to find the optimal thickness of the diffusion layer since it is desirable to form devices that are structurally and electrically sound.
- Regarding claims 5, 14-16 and 27, Applicant Admitted Prior Art (figs. 5A-5B) disclose a lateral, bipolar transistor including the first diffusion layer as a collector, the second diffusion layers as an emitter, and the region of the first conduction type (P) or the diffusion layer 102 as a base is put to operation.

- Regarding claims 6 and 17-20, Applicant Admitted Prior Art (figs. 5A-5B) disclose wherein the first and second diffusion layers 104 and 105 are isolated from each other by a device separating isolation layer 103 on a surface of the substrate.
- Regarding claims 7-8 and 24, Applicant Admitted Prior Art (figs. 5A-5B) disclose the layers 104 and 105 are manufactured with a CMOS gate electrode disposed on a surface of the substrate and obvious in a circular shape.
- Regarding claims 9-10, it would have been obvious and matter of design choice to form the gate electrode is connected to the signal wiring of the internal circuit of the semiconductor IC and fixed to a predetermined potential.
- Regarding claim 11, Applicant Admitted Prior Art (figs. 5A-5B) disclose the first conduction type is a p type and the second conduction type is an n type; and the predetermined potential is a ground potential.
- Regarding claim 12, it would have been obvious and matter of design choice to one having ordinary skill in the art.
- Regarding claim 25, Applicant Admitted Prior Art (figs. 5A-5B) disclose a diffusion region 6 having first conduction type (P) and connected to the ground terminal 9.

Conclusion

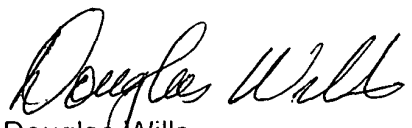
Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (703) 305-6983. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, OLIK CHAUDHURI can be reached on (703) 308-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DLN
January 23, 2002


Douglas Wille
Patent Examiner